Microsoft®

Windows® 2000

Operating System

Microsoft® Windows® 2000 Change and Configuration Management:

Remote Operating System Installation Overview

Abstract

This paper provides an overview of the Microsoft® Windows® 2000 Change and Configuration Management Remote OS Installation feature and the Remote Installation Service (RIS) technologies it uses.

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INTRODUCTION

Remote Operating System (OS) Installation and IntelliMirror™ management technologies are important change and configuration management features included in the Microsoft® Windows® 2000 operating system. Remote OS Installation allows systems administrators to use network boot technology and server-based distribution software to install local copies of the Windows 2000 operating system on personal computers throughout the enterprise. Once Windows 2000 is operational on a PC, IntelliMirror then enables network administrators to provide policy-based management of users' Windows 2000–based desktops, including data, settings, and software.

The following table highlights the Windows 2000 Change and Configuration Management features and benefits, as well as the underlying technologies that support these features.

Windows 2000 Feature		**Benefits**	**Supporting Technologies**
IntelliMirror	User Data Management	Supports mirroring of user data to the network and local caching of selected network data. A common theme is *"My Documents follow me."*	Active Directory™, Group Policy, Offline Folders, Synchronization Manager, enhanced Windows shell, and Disk Quotas.
	Software Installation and Maintenance	Allows administrators to centrally manage software installation (applications, service packs, and operating system updates), repairs, updates, and removal. A common theme is *"My Applications follow me."*	Active Directory, Group Policy, Windows installer service, enhanced Windows shell.
	User and Computer Settings Management	Allows administrators to centrally define computing environment settings for users and computers. Also includes mirroring of user settings to the network. A common theme is *"My Preferences follow me."*	Active Directory, Group Policy, Offline Folders, Roaming user profiles, enhanced Windows shell.
	Remote OS Installation	Easier setup and configuration. Remotely installs the operating system on computers throughout the enterprise. *Note: Requires remote installation-capable*	Active Directory, Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP), Remote Installation Server.

	workstations that support Pre-boot eXecution Environment (PXE)–based Remote Boot ROM technology (for example, Net PC/PC98, Windows 2000, or a network card supported by the Remote Installation Service [RIS] boot floppy).	

This document provides an overview of the Remote OS Installation feature and the Remote Installation Service (RIS) technologies it uses.

Two challenging and costly functions performed by information technology (IT) staff are configuring operating systems and applications on new computers and regenerating or restoring existing desktops for users after a machine fails.

Currently, organizations must do one or more of the following:

- Pre-install operating system and base software components on each new client computer before shipping it to a user.
- Send support staff to each site to manually install operating system and application software.
- Educate users on how to install and configure their own computers.

The new Windows 2000 Remote OS Installation simplifies the task of installing an operating system on client computers throughout the organization. It provides a mechanism for computers to connect to a networked server during initial boot up, and then allow the server to drive a local installation of Windows 2000 Professional. When used with IntelliMirror, RIS reduces the costs incurred to set up new computers, and provides better recovery from computer failures. Whether you are adding or replacing a computer, or returning a repaired computer to the network, RIS provides the services to reload the operating system, while IntelliMirror provides the services to quickly regenerate applications and restore user data and personal computer settings.

Remote OS Installation uses the new Pre-Boot eXecution Environment (PXE) Dynamic Host Configuration Protocol (DHCP)–based remote boot technology to initiate installation of an operating system from a remote source to a client’s local hard disk. The remote source—a server that supports the new Remote Installation Services (RIS)—provides the network equivalent of a CD-based installation of Windows 2000 Professional and pre-configured Sysprep desktop images[1].

[1] Currently, the Windows 2000 Server RIS feature supports

- **CD-based installation.** The CD-based option is similar to setting up a workstation directly from the Windows 2000 Professional compact disc; however, the source files reside across the network on available RIS Servers.
- **Sysprep image format.** The Sysprep imaging option allows a network administrator to clone a standard desktop configuration, complete with OS configurations and desktop customizations. After first installing and configuring Windows 2000, its services, and any standard applications on a workstation, the network administrator runs a wizard that prepares the installation image and replicates it to available RIS Servers. Remote boot–enabled client computers can then request to install that image locally from the available RIS servers on the network.

Either the client computer's BIOS or a special remote boot floppy can initiate a network service boot. When a network service boot is requested, DHCP provides an IP address for the client computer, and the client can then download the client installation wizard. At this point, the wizard will prompt the user to log on, and, depending on the user's credentials or security group membership, the wizard will display a menu that offers appropriate customized unattended operating system installation options. (The network administrator uses policy settings to determine which installation options are available to a user, based on the policy defined for that user at the client machine that initiated the network service boot request.)

Client Installation Options

Once it establishes a connection with the RIS Server, the client installation wizard runs automatically on the client machine. The wizard gives the IT staff or the user a menu of available installation options. RIS uses Group Policy options stored in the Active Directory directory services to determine which installation options should be made available to a particular user, and allows the administrator to designate who can perform specific types of installations within the enterprise. RIS then guides the user through a successful, appropriately tailored operating system installation. For example, a domain administrator can allow all administrative staff access to all installation options, but can restrict a particular user to only one OS option, and have that OS install automatically without prompting the user for input. Because the OS is installed in an unattended manner, the user simply logs into the client installation wizard and the OS installs automatically.

The following installation options are available through the client

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installation of the Windows 2000 Professional operating system on client computers only.

installation wizard.

- **Automatic Setup**—This option provides the easiest operating system installation path. It allows the user to choose which operating system to install, but does not prompt the user for specific configuration settings. If only one operating system option is offered, the user is not prompted, and unattended installation starts automatically.
- **Custom Setup**—This option allows the network administrator to override the automatic computer naming process, as well as the default location within the Active Directory where client computer accounts will be created. Help desk personnel can use this option to pre-install a client computer within the enterprise.
- **Restart a Previous Setup Attempt**—If selected, this option automatically restarts the operating system installation process if an installation attempt fails prior to completion.
- **Maintenance and Troubleshooting**—This option provides access to third-party maintenance and troubleshooting tools that can be used prior to operating system installation, such as system flash BIOS updates and PC diagnostic tools.

Administrative Configuration Options

Remote OS Installation provides configuration options that define how client computers are to be installed and configured. The RIS Server is administered from the Microsoft Directory Services Manager snap-in that runs in the Microsoft Management Console (MMC). The following configuration options are available to the RIS administrator:

- **Define available operating system installation choices**—This option uses Access Control Lists (ACLs) to specify access permissions for a particular user or group of users. This allows the network administrator to guide specific users through the selection of appropriate unattended OS installation options.
- **Define automatic client computer naming format**—This option determines whether the client computer name (which is generated automatically) is to be based on the user name, the user last name followed by first name, or a custom naming format specific to the enterprise (the snap-in allows the administrator to define this format). This option provides flexibility in naming new client computers during operating system installation.
- **Define the default Active Directory (AD) location for all client computer accounts**—This option allows the administrator to select a default Active Directory location where all remotely installed client computer accounts will be created during operating system installation.
- **Pre-stage client computers within the AD prior to servicing**—

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This option allows the administrator to pre-stage client computer accounts to ensure that RIS Servers install software on authorized computers only. To use this option, the administrator must specify the client computer name, the default Active Directory location, and which RIS Server will support specific clients.

- **Offer third-party ISV maintenance and troubleshooting tools**—This option provides IT staff and users with access to maintenance and diagnostic tools from third-party vendors. These tools can be used to maintain and troubleshoot client computers prior to loading or installing the OS. Examples include memory virus scanners, system flash BIOS updates, and PC diagnostic tools.
- **Add additional operating system images in either CD or Sysprep format**—This option allows the administrator to add new operating system versions or Sysprep images to existing RIS Servers within the enterprise. In addition, it allows the administrator to associate a variety of unattended installation templates with existing operating system images, thus providing greater flexibility in installation options.
- **Remotely configure RIS Servers from Windows 2000 Professional workstations**—This option allows the network administrator to remotely change any of the configuration options provided within the administrator's user interface for any of the active RIS Servers within the enterprise. Windows 2000 Professional workstations that have access to the Active Directory can remotely configure RIS settings.
- **Authorization of RIS Servers for rogue server prevention**—This option prevents unauthorized RIS Servers from installing client computers on the network. This allows the network administrator to authorize which RIS Servers can provide installations to remote boot enabled clients.
- **Supports co-existence of multiple vendor installation servers**—This option provides support for systems that have remote installation and boot servers from other vendors operating on the same physical network. Windows 2000 RIS Servers can be set to respond only to Remote OS Installation requests from clients pre-staged in the Active Directory. When set to ignore boot requests from unknown clients, RIS can be introduced into a network without interfering with pre-existing remote boot systems that use the same remote boot protocols.

For more information on Windows management services, including the Change and Configuration Management features of Windows 2000, please see the following locations:

- For management information, refer to the Microsoft Windows management web site, at http://www.microsoft.com/ntserver/management.
- For a step-by-step guide to evaluating Remote OS Installation, read the Remote Installation Technical Walk Through (Reminst.doc). This document is located on the Windows 2000 Server Beta compact disc in the \support\walkthru directory.

For the latest information on Microsoft Windows NT® technologies, check out our World Wide Web site at http://www.microsoft.com/ntserver and the Windows NT Server Forum on the Microsoft Network (GO WORD: MSNTS).